



(19)

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 916 891 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
08.09.1999 Bulletin 1999/36

(51) Int Cl. 6: **F17C 13/04, F17C 13/02,
F17C 5/06**

(43) Date of publication A2:
19.05.1999 Bulletin 1999/20 (a2/5)

(21) Application number: 98309250.3

(22) Date of filing: 12.11.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE

Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 14.11.1997 GB 9724168

(71) Applicant: AIR PRODUCTS AND CHEMICALS,
INC.
Allentown, PA 18195-1501 (US)

(72) Inventors:

- Zheng, Dao Hong
London E12 6QT (GB)
- Irven, John "Midways"
Buckinghamshire HP15 6JS (GB)
- George, Mark A.
Wescosville Pennsylvania 18106 (US)

(74) Representative: Leight, Martin Harvey
W.H. Beck, Greener & Co.
7 Stone Buildings
Lincoln's Inn
London WC2A 3SZ (GB)

(54) **Gas control device and method of supplying gas**

(57) A modular gas control device for use with a compressed gas cylinder (111) comprises a primary module (152) and a secondary module (252) mounted on the primary module. The primary module comprises a first supporting body (154) having a first main gas flow path (155) through the body. The supporting body has input connecting means (156) for mounting the body on the cylinder (111) and connecting the gas flow path (155) to communicate with the gas cylinder through a first flow path (157). Pressure reducing means (166) provides gas in the flow path at a lower pressure than in the container. Output connecting means (170) downstream of the pressure reducing means provides a low pressure outlet from the main gas flow path. A high pressure shut off valve (164) is positioned upstream of the pressure reducing means, and filling means (161, 160) allows filling of the cylinder with compressed gas through the input connecting means (156) along a second flow path (159) separate from the input flow path (157). The secondary module (252) has a corresponding supporting body (254) and main flow path (255) and corresponding output connecting means (270) and corresponding input connecting means (256) for mounting the secondary module (252) on the primary module (152). The supporting body (254) of the secondary module has a combination of two or more functional components comprising means for measuring and/or varying parameters of gas flow in the second supporting body, and/or for switching

and/or venting and/or mixing gas flow in the second supporting body.

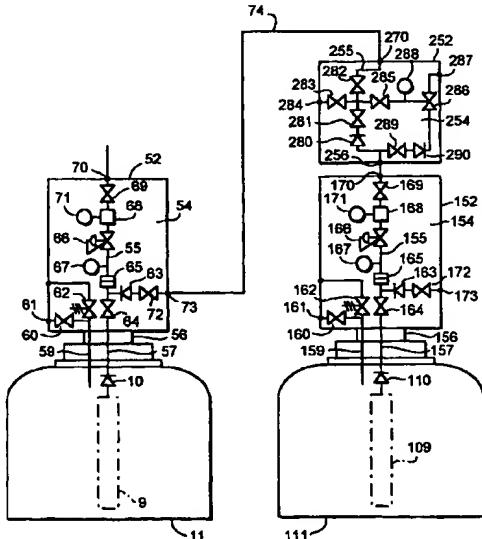


FIG. 3

EP 0 916 891 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 9250

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	WO 96 07843 A (AIR LIQUIDE ;CANNET GILLES (FR); FANO EMMANUEL (FR); ROBIN ALAIN ()) 14 March 1996 (1996-03-14) * claims; figures *	1-23	F17C13/04 F17C13/02 F17C5/06
Y	WO 96 29529 A (INSYNC SYSTEMS INC) 26 September 1996 (1996-09-26) * claims; figures *	1-23	
A	EP 0 688 983 A (NERIKI KK) 27 December 1995 (1995-12-27) ---		
A,D	US 5 163 475 A (GREGOIRE ROGER J) 17 November 1992 (1992-11-17) ---		
A,D	US 5 440 477 A (ROHRBERG RODERICK G ET AL) 8 August 1995 (1995-08-08) ---		
TECHNICAL FIELDS SEARCHED (Int.Cl.6)			
F17C			
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	14 July 1999	Meertens, J	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 98 30 9250

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-07-1999

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9607843	A	14-03-1996		FR 2724241 A		08-03-1996
				AU 687235 B		19-02-1998
				AU 3260995 A		27-03-1996
				BR 9506348 A		02-09-1997
				CA 2175496 A		14-03-1996
				EP 0727021 A		21-08-1996
				JP 9507562 T		29-07-1997
				US 5678602 A		21-10-1997

WO 9629529	A	26-09-1996		US 5605179 A		25-02-1997
				AU 4923296 A		08-10-1996

EP 0688983	A	27-12-1995		AU 691270 B		14-05-1998
				AU 2160895 A		11-01-1996
				JP 8159397 A		21-06-1996
				US 5738145 A		14-04-1998

US 5163475	A	17-11-1992		CA 2080633 A,C		27-05-1993
				DE 69207569 D		22-02-1996
				DE 69207569 T		22-08-1996
				EP 0546280 A		16-06-1993
				ES 2081543 T		01-03-1996

US 5440477	A	08-08-1995		NONE		

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82